# PATENT ABSTRACTS OF JAPAN

(11)Publication number : 11-163501
(43)Date of publication of application : 18.06.1999

(51)Int.Cl. H05K 3/32
H05K 1/18

(21)Application number : 09-331600
(22)Date of filing : 02.12.1997

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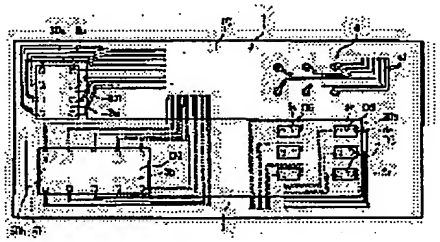
## (54) METHOD FOR MOUNTING ELECTRONIC PART, AND ELECTRONIC CIRCUIT DEVICE MANUFACTURED THEREBY

(57)Abstract:
PROBLEM TO BE SOLVED: To facilitate such work as surface-mounting a plural of electronic parts on a surface where an electronic part is to be mounted such as a printed board surface, for raised work efficiency.
SOLUTION: This mounting method comprises a step of surface-mounting a plurality of electronic parts D1, D2, and D3 having conductor parts 6a, 6b, and 6c for surface mounting on a plurality of terminal part formation regions 3a, 3b, and 3c provided on a surface 10 where electronic part is to be mounted, and forming an anisotropic conductive layer 5 straddling the plurality of terminal part formation regions 3a, 3b, and 3c on the surface 10 where electronic part is to be mounted, and a step of arranging a plurality of electronic parts D1, D2, and D3 above each of the plurality of terminal part formation regions 3a, 3b, and 3c on the anisotropic conductive layer 5, and bonding each conductive parts 6a, 6b, and 6c of the plurality of electronic parts D1, D2, and D3 to terminal parts 30a, 30b, and 30c of the plurality of terminal part formation regions 3a, 3b, and 3c through the anisotropic conductive layer 5 by pressing the plurality of electronic parts D1, D2, and D3 against the anisotropic conductive layer 5.



LEGAL STATUS

[Date of request for examination] 26.08.2004

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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CLAIMS

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[Claim(s)]
[Claim 1] It is the mounting approach of the electronic parts for carrying out surface mounting of two or more electronic parts which have the section to two or more terminal area formation fields in which it is prepared in the field for electronic-parts mounting. the conductor for surface mounting -- The process which forms the anisotropy conductive layer over two or more above-mentioned terminal area formation fields in the above-mentioned field for electronic-parts mounting, By arranging two or more above-mentioned electronic parts in each upper part location of two or more above-mentioned terminal area formation fields on the above-mentioned anisotropy conductive layer, and pushing the electronic parts of these plurality against the above-mentioned anisotropy conductive layer two or more above-mentioned electronic parts -- each -- a conductor -- the mounting approach of electronic parts characterized by having the process which makes each terminal area of two or more above-mentioned terminal area formation fields carry out flow adhesion of the section through the above-mentioned anisotropy conductive layer.
[Claim 2] The above-mentioned anisotropy conductive layer is formed by sticking the anisotropy electric conduction film which the conductive particle distributed and contained in the thermosetting film made of synthetic resin on the above-mentioned field for electronic-parts mounting. Or it is formed by applying to the above-mentioned field for electronic-parts mounting the anisotropy electric conduction adhesives which the conductive particle distributed and contained in the thermosetting adhesives made of synthetic resin. And the mounting approach of electronic parts according to claim 1 of heating the above-mentioned anisotropy conductive layer when pushing two or more above-mentioned electronic parts against the above-mentioned anisotropy conductive layer.
[Claim 3] Electronic-circuitry equipment characterized by carrying out surface mounting of two or more electronic parts to the desired field for electronic-parts mounting by the mounting approach of electronic parts according to claim 1 or 2.

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[Translation done.]

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]
[0001]
[Field of the Invention] The invention in this application relates to the technique for carrying out surface mounting of the electronic parts, such as various kinds of semiconductor devices and a semiconductor device, efficiently at desired members, such as a printed circuit board.
[0002]
[Description of the Prior Art] As everyone knows, when carrying out surface mounting of two or more semiconductor devices to a printed circuit board, generally the pewter reflow method is adopted. This pewter reflow method is a means to which a semiconductor device is carried on that pewter paste, that account printed circuit board of Gokami is put in in a heating furnace, and a reflow (remelting) of the above-mentioned pewter paste is carried out, after applying a pewter paste to the front face of the terminal area currently formed in the printed circuit board. According to such a means, by carrying out heating melting of the pewter paste in each place applied to the printed circuit board, the soldering activity of two or more semiconductor devices can be put in block, and can be performed.
[0003]
[Problem(s) to be Solved by the Invention] However, there were the following faults with the above-mentioned conventional means.
[0004] In order to apply a pewter paste on the surface of a printed circuit board, with the above-mentioned conventional means, it is necessary 1st to apply a pewter paste to the terminal area front face of a printed circuit board in a high precision using an airline printer. If a pewter paste overflows a terminal area front face greatly, poor conductive connection may be produced and it is necessary to perform printing of the above-mentioned pewter paste to a precision. Therefore, with the above-mentioned conventional means, spreading of a pewter paste has become very complicated and there was a case where the whole working capacity worsened. There were many electronic parts mounted in a printed circuit board, many parts which apply a pewter paste came out, and, in a certain case, especially fault such was much more remarkable.
[0005] With the above-mentioned conventional means, since it is necessary to heat those whole to the melting temperature of a pewter after putting in a printed circuit board in a heating furnace, the components inferior to thermal resistance cannot be beforehand mounted [ 2nd ] in the above-mentioned printed circuit board. Therefore, in the former, when various components were mounted in a printed circuit board, the mounting sequence of those components needed to be considered so that the components inferior to thermal resistance might not receive a damage with heating, it was inflexible to the mounting activity of those components, and there was a case where this became inconvenient.
[0006] In addition, in the former, there is a means using an anisotropy electric conduction film as a different means from a means to use the describing [ above ] pewter reflow method. This means is a means by which it is suitable when carrying out surface mounting of the semiconductor device which has the terminal or electrode of the letter of a projection, and after it makes an anisotropy electric conduction film intervene between the terminal area formation field of a printed circuit board, and a semiconductor device, it is a means which pushes a semiconductor device against the above-mentioned anisotropy electric conduction film, heating the above-mentioned anisotropy electric conduction film. pasting up the above-mentioned semiconductor device through an anisotropy electric conduction film with this means on the surface of a printed circuit board -- things are made. Moreover, only the field between the terminal areas of the printed circuit board which meets the terminal of the letter of a projection of only the part by which the anisotropy electric conduction film was pressed, i.e., a semiconductor device, or an electrode, and it will have conductivity. Therefore, according to the means using an anisotropy electric conduction film, unlike the case of the pewter reflow method, the components which it becomes unnecessary to heat the whole printed circuit board, and are inferior to thermal resistance become possible [ abolishing a possibility that heating may receive a damage ].
[0007] However, when an anisotropy electric conduction film was used in the former, after producing the

anisotropy electric conduction film of two or more sheets corresponding to each configuration and size of the terminal area formation field established in the printed circuit board, the actual condition had stuck the anisotropy electric conduction film of two or more of these sheets on each of two or more above-mentioned terminal area formation fields separately. [ two or more ] For this reason, in the former, the activity which produces the anisotropy electric conduction film of two or more above-mentioned sheets, and the activity which sticks the anisotropy electric conduction film of two or more of these sheets on a printed circuit board were complicated.

[0008] The invention in this application is invented under such circumstances, attains easy-ization of the activity which carries out surface mounting of two or more electronic parts to fields for electronic-parts mounting, such as a printed circuit board front face, and makes it the technical problem to raise the working capacity.

[0009]

[Description of the Invention] In order to solve the above-mentioned technical problem, the following technical means are provided in the invention in this application.

[0010] According to the 1st side face of the invention in this application, the mounting approach of electronic parts is offered. the mounting approach of these electronic parts — the conductor for surface mounting — two or more electronic parts which have the section The process which is the mounting approach of the electronic parts for carrying out surface mounting, and forms the anisotropy conductive layer over two or more above-mentioned terminal area formation fields in two or more terminal area formation fields established in the field for electronic-parts mounting in the above-mentioned field for electronic-parts mounting, By arranging two or more above-mentioned electronic parts in each upper part location of two or more above-mentioned terminal area formation fields on the above-mentioned anisotropy conductive layer, and pushing the electronic parts of these plurality against the above-mentioned anisotropy conductive layer two or more above-mentioned electronic parts — each — a conductor — it characterizes to have the process which makes each terminal area of two or more above-mentioned terminal area formation fields carry out flow adhesion of the section through the above-mentioned anisotropy conductive layer.

[0011] any of two or more terminal area formation fields established in the field for electronic-parts mounting in the invention in this application — also receiving — the terminal area of each [ these ] terminal area formation field — receiving — the conductor for the surface mounting of electronic parts — flow adhesion of the section can be carried out through an anisotropy conductive layer, and surface mounting of two or more electronic parts can be performed exactly. On the other hand, in the invention in this application, in forming an anisotropy conductive layer in the field for electronic-parts mounting, an anisotropy conductive layer is not separately formed for every terminal area formation field, but it forms the anisotropy conductive layer in the condition of having made a single string straddling two or more terminal area formation fields. Therefore, as compared with the former, the activity which forms an anisotropy conductive layer in the field for electronic-parts mounting becomes it is remarkable and easy. Consequently, in the invention in this application, the working efficiency of the mounting activity of electronic parts can be raised. in addition — although the anisotropy conductive layer is formed also in fields other than a terminal area formation field in the invention in this application — the above-mentioned anisotropy conductive layer — the conductor of electronic parts — since it is what has the property of making it flowing only through the part which received the compressive force between the section and each terminal area of a terminal area formation field electrically, of course, there is no fault of producing electric defective continuity, by having formed the above-mentioned anisotropy conductive layer in fields other than a terminal area. In the invention in this application, since the field for electronic-parts mounting can be covered by the anisotropy conductive layer formed in a large area, the effectiveness that this anisotropy conductive layer can be utilized as an insulating layer which protects the field for electronic-parts mounting is also acquired.

[0012] With the gestalt of desirable operation of the invention in this application, the above-mentioned

anisotropy conductive layer It is formed by sticking the anisotropy electric conduction film which the conductive particle distributed and contained in the thermosetting film made of synthetic resin on the above-mentioned field for electronic-parts mounting. Or it is formed by applying to the above-mentioned field for electronic-parts mounting the anisotropy electric conduction adhesives which the conductive particle distributed and contained in the thermosetting adhesives made of synthetic resin. And when pushing two or more above-mentioned electronic parts against the above-mentioned anisotropy conductive layer, it can consider as the configuration which heats the above-mentioned anisotropy conductive layer.

[0013] According to such a configuration, when the anisotropy conductive layer is formed with the above-mentioned anisotropy electric conduction film, when pushing two or more electronic parts against this anisotropy conductive layer, melting softening of this anisotropy conductive layer can be carried out with heating, and the adhesive property which pastes up each electronic parts on the field for electronic-parts mounting by this will be acquired. Furthermore, if whenever [ stoving temperature / of an anisotropy conductive layer ] is raised after that, it will also become possible to carry out heat curing of the anisotropy conductive layer which carried out melting softening for a short time. Moreover, when the above-mentioned anisotropy conductive layer is formed by anisotropy electric conduction adhesives, itself demonstrates the function to paste up two or more electronic parts on the field for electronic-parts mounting, and also finally heat curing of the above-mentioned anisotropy conductive layer can be carried out by heating this anisotropy conductive layer too. Thus, if an anisotropy conductive layer is stiffened with heating, adhesion maintenance of the electronic parts can be carried out certainly and firmly to the field for electronic-parts mounting. Moreover, unlike hardening by natural neglect, the hardening activity of an anisotropy conductive layer can be done in a short time.

[0014] According to the 2nd side face of the invention in this application, electronic-circuitry equipment is offered. This electronic-circuitry equipment is characterized by two or more electronic parts by the mounting approach of the electronic parts offered by the 1st side face of the invention in this application for surface mounting to be carried out to the desired field for electronic-parts mounting.

[0015] Although the electronic-circuitry equipment offered by the 2nd side face of the invention in this application has the structure where surface mounting of two or more electronic parts was appropriately carried out to two or more terminal area formation fields through the anisotropy conductive layer, since the manufacture can be well performed as it was mentioned already, the manufacturing cost can be made cheap.

[0016]

[Embodiment of the Invention] Hereafter, the gestalt of desirable operation of the invention in this application is explained concretely, referring to a drawing.

[0017] Drawing 1 is the top view showing an example of the printed circuit board used for the mounting approach of the electronic parts concerning the invention in this application. Drawing 2 (a) – (c) is drawing showing the example of the electronic parts used for the mounting approach of the electronic parts concerning the invention in this application. Drawing 3 thru/or drawing 6 show the routing of the mounting approach of the electronic parts concerning the invention in this application, drawing 3 and drawing 4 are top views, and drawing 5 and drawing 6 are important section sectional views.

[0018] The printed circuit board 1 shown in drawing 1 is formed of synthetic resin, such as for example, a glass epoxy resin, or other insulating materials, and is formed in the shape of [ of a plane view abbreviation rectangle ] a plate. The front face 10 of this printed circuit board 1 is a part equivalent to an example of the field for electronic-parts mounting as used in the field of the invention in this application, and the circuit pattern for planning conductive connection with two or more electronic parts mounted in this front face 10 is formed in this front face 10 of copper foil etc.

[0019] More specifically, two or more terminal area formation field 3c for mounting two terminal area formation fields 3a and 3b for mounting two semiconductor devices D1 and D2 mentioned later, respectively and two or more semiconductor devices D3 mentioned later is prepared in the front face 10

of the above-mentioned printed circuit board 1. The above-mentioned terminal area formation field 3a is the part which formed plain-view substantially rectangle-shaped terminal area 30a in each point of electric conduction wiring 2a of two or more articles, and prepared terminal area 30a of these plurality in the predetermined array. Similarly the above-mentioned terminal area formation field 3b prepares terminal area 30b formed in each point of electric conduction wiring 2b of two or more articles in a predetermined array, and each above-mentioned terminal area formation field 3c is the part which prepared terminal area 30c formed in each point of electric conduction wiring 2c of two or more articles in the predetermined array.

[0020] Other fields 4 for mounting electronic parts by different approach from surface mounting are established in the front face 10 of the above-mentioned printed circuit board 1. This field 4 is a field for mounting electronic parts by the so-called pin plug method, and is considered as the configuration which formed the pore 40 for inserting the terminal of the shape of a pin of electronic parts in each point of the electric conduction wiring 41 of two or more articles. as for the above-mentioned printed circuit board 1, a circuit pattern is formed in the front face 10 — **** — it does not restrict but the circuit pattern is formed also in the rear face if needed. However, with this operation gestalt, about the circuit pattern of the rear face of the above-mentioned printed circuit board 1, and the mounting approach of electronic parts for the rear face, it is the same as that of it to a front face 10, and the explanation is omitted for convenience.

[0021] as the above-mentioned semiconductor devices D1 and D2 and a semiconductor device D3 are shown in drawing 2 , surface mounting constitutes all possible — having — the conductor for the surface mounting as a terminal or an electrode — it has the section. That is, as shown in this drawing (a), a semiconductor device D1 is a semiconductor device of the resin package mold of structure called the so-called J lead type, and it carries out the resin package of these wires W, the semiconductor chip 60, etc. with closure resin 62 while it makes connection connection of the semiconductor chip 60 by which bonding was carried out on the die pad 61 through Wire W to two or more lead terminal 6a. Crookedness formation is carried out at the letter of the cross-section abbreviation for J characters so that the point may be located in the inferior surface of tongue of closure resin 62, and surface mounting is possible for lead terminal 6a of the above-mentioned two or more books using the point of such lead terminal 6a.

[0022] As shown in this drawing (b), although a semiconductor device D2 is a semiconductor device of the type called the so-called ball grid array, and the resin package of the semiconductor chip is carried out like the above-mentioned semiconductor device D1 and it is constituted, terminal 6b of two or more letters of a projection formed with the pewter ball is prepared in the inferior-surface-of-tongue section of the closure resin 62a. Although this semiconductor device D2 is essentially constituted so that it may be soldered to a desired location using the above-mentioned terminal 6b, such a semiconductor device can also be used as the components for mounting in the invention in this application. As shown in this drawing (c), a semiconductor device D3 is formed as for example, a chip mold capacitor or a chip mold resistor, and has the composition that the metal electrodes 6c and 6c were formed in the right-and-left both ends of a semiconductor chip 63. The above-mentioned electrodes 6c and 6c are formed in the shape of [ which swelled to the method of outside / front face / of a semiconductor chip 63 ] a stage, and those of this semiconductor device D3 are possible for surface mounting by making the field for mounting carry out flow adhesion of the above-mentioned electrodes 6c and 6c.

[0023] In order to carry out surface mounting of each of the above-mentioned semiconductor devices D1 and D2 and a semiconductor device D3 to the front face 10 of the above-mentioned printed circuit board 1, as first shown in drawing 3 , the anisotropy electric conduction film 5 of one sheet is stuck on the front face 10 of the above-mentioned printed circuit board 1. This anisotropy electric conduction film 5 distributes the conductive particles 51, such as metal particles, and is made to contain for example, in the film made of an epoxy resin which has thermosetting as it appears in drawing 5 well. Since the conductive particle 51 is distributing inside this anisotropy electric conduction film 5,

essentially, it does not have conductivity in that thickness direction. However, when this anisotropy electric conduction film 5 receives predetermined compressive force in that thickness direction, the consistency of the conductive particle 51 of the part which received that compressive force increases and these contact mutually, only the part which received that compressive force will have conductivity. With this operation gestalt, the anisotropy electric conduction film 5 located on the above-mentioned printed circuit board 1 is equivalent to the anisotropy conductive layer as used in the field of the invention in this application.

[0024] The above-mentioned anisotropy electric conduction film 5 is formed in a wrap configuration and size in the quite large range of the front face 10 of the above-mentioned printed circuit board 1, and each of two or more terminal area formation fields 3a-3c is covered with a single string with the above-mentioned anisotropy electric conduction film 5. However, about the predetermined field 4 used as a surface mounting object, it is considered so that it may not be covered with the above-mentioned anisotropy electric conduction film 5. Although the above-mentioned anisotropy electric conduction film 5 is stuck on the front face 10 of a printed circuit board 1, pasting as used in the field of the invention in this application is not necessarily a concept which the anisotropy electric conduction film 5 does not need to paste a printed circuit board front face positively, and also includes the case of only carrying the anisotropy electric conduction film 5 on a printed circuit board front face. In addition, in practice, it is desirable to carry out temporary adhesion of the above-mentioned anisotropy electric conduction film 5 on a printed circuit board front face so that the anisotropy electric conduction film 5 may not carry out a location gap carelessly on a printed circuit board 1.

[0025] Subsequently, as shown in drawing 4 and drawing 5 , on the above-mentioned anisotropy electric conduction film 5, semiconductor devices D1 and D2 and two or more semiconductor devices D3 are laid. Installation of the 1st semiconductor device D1 is performed so that two or more of the lead terminal 6a may be located in the upper part of each terminal area 30a of terminal area formation field 3a. Moreover, similarly, about the 2nd semiconductor device D2, it lays so that two or more of the terminal 6b may be located in the upper part of each terminal area 30b of terminal area formation field 3b, and further, about each semiconductor device D3, it lays so that the electrodes 6c and 6c may be located in the upper part of each terminal area 30c of each terminal area formation field 3c.

[0026] Moreover, when the above-mentioned semiconductor devices D1 and D2 and two or more semiconductor devices D3 are laid on the above-mentioned anisotropy electric conduction film 5, those electronic parts are pushed against the front face of this anisotropy electric conduction film 5, heating the anisotropy electric conduction film 5. As shown in drawing 6 , when a semiconductor device D1 is specifically laid on the anisotropy electric conduction film 5 using a collet 7, this collet 7 is used and a semiconductor device D1 is pushed caudad. Moreover, the means of arranging a heater, for example under the printed circuit board 1, or making a heater build in the member which presses a semiconductor device D1 as a means to heat the above-mentioned anisotropy electric conduction film 5 is employable. Furthermore, when pushing the above-mentioned semiconductor device D1, a means to make the supersonic wave generated in the horn 70 act on the above-mentioned anisotropy electric conduction film 5 can also be used together.

[0027] If such an activity is done, while softening the above-mentioned anisotropy electric conduction film 5 with heating, between lead terminal 6a of a semiconductor device D1 and terminal area 30a which counters it will receive compressive force, and the conductive particle 51 of the part will contact the front face of the above-mentioned lead terminal 6a, and the front face of terminal area 30a, respectively. For this reason, it flows through the above-mentioned lead terminal 6a and terminal area 30a through the conductive particle 51. If a supersonic wave is made to act on this part, the effectiveness of sticking the above-mentioned conductive particle 51 more certainly to the front face of the above-mentioned lead terminal 6a or terminal area 30a will be acquired. On the other hand, about any parts other than the above of the anisotropy electric conduction film 5, big compressive force is not received, and since the condition that the conductive particle 51 distributed has been held, it does not have conductivity.

Therefore, about the above-mentioned semiconductor device D1, flow connection only of the lead terminal 6a will be made with each terminal area 30a of terminal area formation field 3a. Moreover, the whole inferior-surface-of-tongue section containing lead terminal 6a of the above-mentioned semiconductor device D1 will be pasted up more on the front face 10 of a printed circuit board 1 through the softened anisotropy electric conduction film 5 and the resin in the condition that the anisotropy electric conduction film 5 carried out melting softening at accuracy. If whenever [ stoving temperature / of the above-mentioned anisotropy electric conduction film 5 ] is raised, the resin which carried out [ above-mentioned ] melting softening can be stiffened. Therefore, it becomes possible to carry out adhesion maintenance of the above-mentioned semiconductor device D1 certainly [ the surface field of terminal area formation field 3a of a printed circuit board 1 ], and firmly. Such an operation is similarly acquired in the relation between each terminal area 30b of terminal 6b of other semiconductor devices D2, and terminal area formation field 3b, and the electrodes 6c and 6c of each semiconductor device D3 and each terminal area 30c of terminal area formation field 3c.

[0028] After the routing of a top Norikazu ream sticks the anisotropy electric conduction film 5 of one sheet on the predetermined field of the front face 10 of a printed circuit board 1, it is a routing which mounts semiconductor devices D1 and D2 and two or more semiconductor devices D3, respectively, and becomes very easy [ the activity of these single strings ]. Therefore, it becomes possible to make cheap the manufacturing cost of the electronic-circuitry equipment constituted using the above-mentioned printed circuit board 1, the above-mentioned semiconductor devices D1 and D2, a semiconductor device D3, etc. Moreover, since the part in which neither each above-mentioned semiconductor devices D1 and D2 nor a semiconductor device D3 is mounted among every place of this anisotropy electric conduction film 5 serves as an insulating layer after carrying out heat curing of the above-mentioned whole anisotropy electric conduction film 5, the function in which the above-mentioned anisotropy electric conduction film 5 plans insulation protection of every place of the front face 10 of a printed circuit board 1 will also be demonstrated.

[0029] Drawing 7 (a) and (b) are the top views showing other examples of the anisotropy electric conduction film used by the invention in this application.

[0030] That is, the anisotropy electric conduction film 5 shown in this drawing (a) is the configuration which formed the notching section 52 in the part. This drawing (b) is the configuration which formed the non-notching-like opening hole 53 in the anisotropy electric conduction film 5. Thus, if the notching section 52 and opening 53 are formed in the anisotropy electric conduction film 5, the part where this anisotropy electric conduction film 5 is arranged can be chosen as arbitration, forming an anisotropy electric conduction film in the shape of [ of one sheet ] a film. However, the invention in this application does not necessarily need to form an anisotropy electric conduction film as a film of one sheet, and [ when the surface mounting field of electronic parts is very big size ], when the configuration is complicated, it may divide an anisotropy electric conduction film into the film of two or more sheets. What is necessary is to just be prepared in short, in the invention in this application, so that the anisotropy electric conduction film of one sheet may straddle two or more terminal area formation fields.

[0031] The invention in this application is not necessarily limited to the means using an anisotropy electric conduction film as a means to form an anisotropy conductive layer. That is, in the invention in this application, it may replace with an anisotropy electric conduction film, and anisotropy electric conduction adhesives may be used. In adhesives made of synthetic resin, such as a thermosetting epoxy resin, these anisotropy electric conduction adhesives distribute a conductive particle, are made to contain, and can form an anisotropy conductive layer by applying these anisotropy electric conduction adhesives on the surface of a printed circuit board. Since these anisotropy electric conduction adhesives have the function in which itself pastes up electronic parts on the surface of a printed circuit board, it is not necessary to heat these anisotropy electric conduction adhesives for the purpose of pasting up electronic parts on a printed circuit board. However, if these anisotropy electric conduction adhesives are heated after making flow connection of the electronic parts through anisotropy electric

conduction adhesives in the predetermined location of a printed circuit board, these anisotropy electric conduction adhesives can be stiffened and the mounting condition of electronic parts can be stabilized rather than the case of hardening by natural neglect for a short time.

[0032] in addition, the concrete configuration of each routing of the mounting approach of the electronic parts concerning the invention in this application is not limited to the above-mentioned operation gestalt, but can be freely changed into versatility. moreover, similarly, various concrete configurations of the electronic-circuitry equipment concerning the invention in this application are also boiled, and a design change is free for them. No concrete class, concrete application, etc. of electronic-circuitry equipment which are manufactured by the mounting approach of the electronic parts of the invention in this application are asked. furthermore, the class of electronic parts used as the candidate for mounting is also limited -- not having -- the conductor for surface mounting -- if it is the electronic parts which have the sections (a terminal, electrode, etc.), the class cannot be asked but it can consider as the candidate for application of the invention in this application.

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the top view showing an example of the printed circuit board used for the mounting approach of the electronic parts concerning the invention in this application.

[Drawing 2] The example of the electronic parts used for the mounting approach of the electronic parts concerning the invention in this application is shown, and (a) is [ a perspective view and (c of a sectional view and (b)) ] sectional views.

[Drawing 3] It is the top view showing the routing of the mounting approach of the electronic parts concerning the invention in this application.

[Drawing 4] It is the top view showing the routing of the mounting approach of the electronic parts concerning the invention in this application.

[Drawing 5] It is the important section sectional view showing the routing of the mounting approach of the electronic parts concerning the invention in this application.

[Drawing 6] It is the important section sectional view showing the routing of the mounting approach of the electronic parts concerning the invention in this application.

[Drawing 7] It is the top view showing other examples of the anisotropy electric conduction film used by the invention in this application.

[Description of Notations]

1 Printed Circuit Board
5 Anisotropy Electric Conduction Film
10 Front Face (Field for Electronic-Parts Mounting)
D1, D2 Semiconductor device (electronic parts)

D3 Semiconductor chip (electronic parts)
3a–3c Terminal area formation field
6a Lead terminal (conductor section)
6b Terminal (conductor section)
6c Electrode (conductor section)
30a–30c Terminal area

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[Translation done.]

(19)日本国特許庁（ＪＰ）　(12) **公開特許公報**（Ａ）　(11)特許出願公開番号

**特開平11－163501**

(43)公開日　平成11年(1999)６月18日

| (51)Int.Cl.[6] | 識別記号 | ＦＩ | |
|---|---|---|---|
| Ｈ０５Ｋ　3/32 | | Ｈ０５Ｋ　3/32 | Ｂ |
| 1/18 | | 1/18 | Ｊ |

審査請求　未請求　請求項の数３　ＯＬ　（全８頁）

(21)出願番号　特願平9－331600

(22)出願日　平成９年(1997)12月２日

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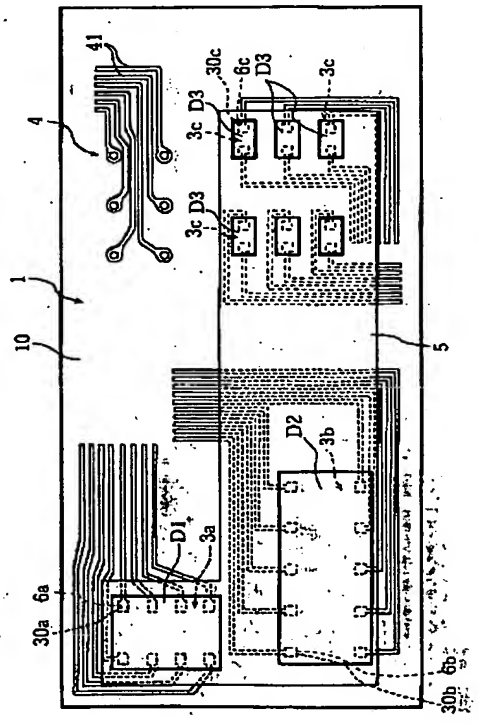
(54)【発明の名称】　電子部品の実装方法、およびその方法によって製造された電子回路装置

(57)【要約】

【課題】プリント基板表面などの電子部品実装対象面に対して複数の電子部品を面実装する作業の容易化を図り、その作業能率を高める。

【解決手段】面実装用の導体部６ａ，６ｂ，６ｃを有する複数の電子部品Ｄ１，Ｄ２，Ｄ３を、電子部品実装対象面１０に設けられている複数の端子部形成領域３ａ，３ｂ，３ｃに面実装するための電子部品の実装方法であって、電子部品実装対象面１０に、複数の端子部形成領域３ａ，３ｂ，３ｃに跨がる異方性導電層５を形成する工程と、異方性導電層５上における複数の端子部形成領域３ａ，３ｂ，３ｃのそれぞれの上方位置に複数の電子部品Ｄ１，Ｄ２，Ｄ３を配置し、かつこれら複数の電子部品Ｄ１，Ｄ２，Ｄ３を異方性導電層５に押しつけることにより、複数の電子部品Ｄ１，Ｄ２，Ｄ３の各導体部６ａ，６ｂ，６ｃを異方性導電層５を介して複数の端子部形成領域３ａ，３ｂ，３ｃの各端子部３０ａ，３０ｂ，３０ｃに導通接着させる工程とを有する。



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【特許請求の範囲】

【請求項１】　面実装用の導体部を有する複数の電子部品を、電子部品実装対象面に設けられている複数の端子部形成領域に面実装するための電子部品の実装方法であって、

上記電子部品実装対象面に、上記複数の端子部形成領域に跨がる異方性導電層を形成する工程と、

上記異方性導電層上における上記複数の端子部形成領域のそれぞれの上方位置に上記複数の電子部品を配置し、かつこれら複数の電子部品を上記異方性導電層に押しつけることにより、上記複数の電子部品の各導体部を上記異方性導電層を介して上記複数の端子部形成領域の各端子部に導通接着させる工程と、

を有することを特徴とする、電子部品の実装方法。

【請求項２】　上記異方性導電層は、熱硬化性の合成樹脂製フィルム内に導電性粒子が分散して含有された異方性導電フィルムを上記電子部品実装対象面に貼付することにより形成され、または熱硬化性の合成樹脂製接着剤内に導電性粒子が分散して含有された異方性導電接着剤を上記電子部品実装対象面に塗布することによって形成されており、かつ、

上記複数の電子部品を上記異方性導電層に押しつけるときには、上記異方性導電層を加熱する、請求項１に記載の電子部品の実装方法。

【請求項３】　請求項１または２に記載の電子部品の実装方法によって、複数の電子部品が所望の電子部品実装対象面に面実装されていることを特徴とする、電子回路装置。

【発明の詳細な説明】

【０００１】

【技術分野】本願発明は、プリント基板などの所望の部材に各種の半導体装置や半導体素子などの電子部品を効率良く面実装するための技術に関する。

【０００２】

【従来の技術】周知のとおり、プリント基板に複数の半導体装置を面実装する場合には、一般にはハンダリフロー法が採用されている。このハンダリフロー法は、プリント基板に形成されている端子部の表面にハンダペーストを塗布した後に、そのハンダペースト上に半導体装置を載せ、その後上記プリント基板を加熱炉内に入れて、上記ハンダペーストをリフロー（再溶融）させる手段である。このような手段によれば、プリント基板に塗布された各所のハンダペーストを加熱溶融させることによって、複数の半導体装置のハンダ付け作業を一括して行うことができる。

【０００３】

【発明が解決しようとする課題】しかしながら、上記従来の手段では、次のような不具合があった。

【０００４】第１に、上記従来の手段では、プリント基板の表面にハンダペーストを塗布するには、印刷装置を

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用いてハンダペーストをプリント基板の端子部表面に高い精度で塗布する必要がある。端子部表面からハンダペーストが大きくはみ出すと、導電接続不良を生じる場合があり、上記ハンダペーストの印刷作業は精密に行う必要がある。したがって、上記従来の手段では、ハンダペーストの塗布作業が非常に煩雑となっており、全体の作業能率が悪くなる場合があった。とくに、このような不具合は、プリント基板に実装する電子部品の数が多く、ハンダペーストを塗布する箇所が多数である場合には一層顕著となっていた。

【０００５】第２に、上記従来の手段では、プリント基板を加熱炉内に入れてからそれらの全体をハンダの溶融温度まで加熱する必要があるために、上記プリント基板には耐熱性に劣る部品を予め実装しておくことができない。したがって、従来では、プリント基板に種々の部品を実装する場合に、耐熱性に劣る部品が加熱によってダメージを受けないようにそれらの部品の実装順序を配慮する必要があり、それらの部品の実装作業に融通がきかず、これが不便となる場合があった。

【０００６】なお、従来では、上記ハンダリフロー法を用いる手段とは異なる手段として、異方性導電フィルムを用いる手段がある。この手段は、突起状の端子または電極を有する半導体装置を面実装する場合に適する手段であり、プリント基板の端子部形成領域と半導体装置との間に異方性導電フィルムを介在させてから、上記異方性導電フィルムを加熱しながら半導体装置を上記異方性導電フィルムに押しつける手段である。この手段では、上記半導体装置をプリント基板の表面に異方性導電フィルムを介して接着することことができる。また、異方性導電フィルムが押圧された部分のみ、すなわち半導体装置の突起状の端子または電極とそれに対面するプリント基板の端子部との間の領域のみが導電性を有することとなる。したがって、異方性導電フィルムを用いる手段によれば、ハンダリフロー法の場合とは異なり、プリント基板の全体を加熱する必要がなくなり、耐熱性に劣る部品が加熱によってダメージを受ける虞れをなくすことが可能となる。

【０００７】ところが、従来において異方性導電フィルムを用いる場合には、プリント基板に複数設けられている端子部形成領域のそれぞれの形状やサイズに見合った複数枚の異方性導電フィルムを作製してから、これら複数枚の異方性導電フィルムを上記複数の端子部形成領域のそれぞれに個々に貼付していたのが実情であった。このため、従来では、上記複数枚の異方性導電フィルムを作製する作業や、それら複数枚の異方性導電フィルムをプリント基板に貼付する作業が煩雑となっていた。

【０００８】本願発明は、このような事情のもとで考え出されたものであって、プリント基板表面などの電子部品実装対象面に対して複数の電子部品を面実装する作業の容易化を図り、その作業能率を高めることをその課題

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としている。

【０００９】

【発明の開示】上記の課題を解決するため、本願発明では、次の技術的手段を講じている。

【００１０】本願発明の第１の側面によれば、電子部品の実装方法が提供される。この電子部品の実装方法は、面実装用の導体部を有する複数の電子部品を、電子部品実装対象面に設けられている複数の端子部形成領域に面実装するための電子部品の実装方法であって、上記電子部品実装対象面に、上記複数の端子部形成領域に跨がる異方性導電層を形成する工程と、上記異方性導電層上における上記複数の端子部形成領域のそれぞれの上方位置に上記複数の電子部品を配置し、かつこれら複数の電子部品を上記異方性導電層に押しつけることにより、上記複数の電子部品の各導体部を上記異方性導電層を介して上記複数の端子部形成領域の各端子部に導通接着させる工程と、を有することに特徴づけられる。

【００１１】本願発明においては、電子部品実装対象面に設けられている複数の端子部形成領域のいずれに対しても、それら各端子部形成領域の端子部に対して電子部品の面実装用の導体部を異方性導電層を介して導通接着させることができ、複数の電子部品の面実装が的確に行えることとなる。一方、本願発明では、電子部品実装対象面に異方性導電層を形成する場合には、１つの端子部形成領域ごとに個々に異方性導電層を形成するのではなく、複数の端子部形成領域に一連に跨がらせた状態に異方性導電層を形成している。したがって、従来と比較して、異方性導電層を電子部品実装対象面に形成する作業が著しく容易となる。その結果、本願発明では、電子部品の実装作業の作業効率を高めることができる。なお、本願発明では、異方性導電層が端子部形成領域以外の領域にも形成されているが、上記異方性導電層は電子部品の導体部と端子部形成領域の各端子部との間の圧縮力を受けた部分のみを電気的に導通させる特性を有するものであるため、上記異方性導電層を端子部以外の領域に形成したことによって電気的な導通不良を生じるといった不具合はむろんない。本願発明では、広い面積に形成された異方性導電層によって電子部品実装対象面を覆うことができるために、この異方性導電層を電子部品実装対象面を保護する絶縁層として役立たせることができるという効果も得られる。

【００１２】本願発明の好ましい実施の形態では、上記異方性導電層は、熱硬化性の合成樹脂製フィルム内に導電性粒子が分散して含有された異方性導電フィルムを上記電子部品実装対象面に貼付することにより形成され、または熱硬化性の合成樹脂製接着剤内に導電性粒子が分散して含有された異方性導電接着剤を上記電子部品実装対象面に塗布することによって形成されており、かつ上記複数の電子部品を上記異方性導電層に押しつけるときには、上記異方性導電層を加熱する構成とすることができる。

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【００１３】このような構成によれば、異方性導電層が上記異方性導電フィルムによって形成されている場合には、複数の電子部品をこの異方性導電層に押しつけるときにこの異方性導電層を加熱によって溶融軟化させることができ、これによって各電子部品を電子部品実装対象面に接着する接着性が得られることとなる。さらに、その後異方性導電層の加熱温度を高めると、溶融軟化した異方性導電層を短時間で熱硬化させることも可能となる。また、上記異方性導電層が異方性導電接着剤によって形成されている場合には、それ自体が複数の電子部品を電子部品実装対象面に接着させる機能を発揮する他、やはりこの異方性導電層を加熱することによって上記異方性導電層を最終的には熱硬化させることができる。このようにして、異方性導電層を加熱により硬化させれば、電子部品を電子部品実装対象面に対して確実かつ強固に接着保持させておくことができる。また、自然放置による硬化とは異なり、異方性導電層の硬化作業を短時間で行うことができる。

【００１４】本願発明の第２の側面によれば、電子回路装置が提供される。この電子回路装置は、本願発明の第１の側面によって提供される電子部品の実装方法によって、複数の電子部品が所望の電子部品実装対象面に面実装されていることに特徴づけられる。

【００１５】本願発明の第２の側面によって提供される電子回路装置は、複数の電子部品が異方性導電層を介して複数の端子部形成領域に対して適切に面実装された構造を有するが、その製造は既述したとおり能率良く行えるために、その製造コストを安価にできる。

【００１６】

【発明の実施の形態】以下、本願発明の好ましい実施の形態について、図面を参照しつつ具体的に説明する。

【００１７】図１は、本願発明に係る電子部品の実装方法に用いられるプリント基板の一例を示す平面図である。図２（ａ）～（ｃ）は、本願発明に係る電子部品の実装方法に用いられる電子部品の具体例を示す図である。図３ないし図６は、本願発明に係る電子部品の実装方法の作業工程を示し、図３および図４は平面図であり、図５および図６は要部断面図である。

【００１８】図１に示すプリント基板１は、たとえばガラスエポキシ樹脂などの合成樹脂、あるいはその他の絶縁材料によって形成されており、平面視略矩形のプレート状に形成されている。このプリント基板１の表面１０は、本願発明でいう電子部品実装対象面の一例に相当する部分であり、この表面１０には、この表面１０に実装される複数の電子部品との導電接続を図るための配線パターンが銅箔などによって形成されている。

【００１９】より具体的には、上記プリント基板１の表面１０には、後述する２つの半導体装置Ｄ１，Ｄ２をそれぞれ実装するための２つの端子部形成領域３ａ，３

ｂ、および後述する複数の半導体素子Ｄ３を実装するための複数の端子部形成領域３ｃが設けられている。上記端子部形成領域３ａは、複数条の導電配線２ａの各先端部に平面視略矩形状の端子部３０ａを形成し、これら複数の端子部３０ａを所定の配列に設けた部分である。同様に、上記端子部形成領域３ｂは、複数条の導電配線２ｂの各先端部に形成された端子部３０ｂを所定の配列に設け、また上記各端子部形成領域３ｃは、複数条の導電配線２ｃの各先端部に形成された端子部３０ｃを所定の配列に設けた部分である。

【００２０】上記プリント基板１の表面１０には、電子部品を面実装とは異なる方法で実装するための他の領域４も設けられている。この領域４は、いわゆるピン差し込み方式で電子部品を実装するための領域であり、複数条の導電配線４１の各先端部に電子部品のピン状の端子を挿入するための孔部４０を設けた構成とされている。上記プリント基板１は、その表面１０に配線パターンが形成されているに限らず、必要に応じてその裏面にも配線パターンが形成されている。ただし、本実施形態では、上記プリント基板１の裏面の配線パターンおよびその裏面に対する電子部品の実装方法については、表面１０に対するそれと同様であり、その説明は便宜上省略する。

【００２１】上記半導体装置Ｄ１，Ｄ２、および半導体素子Ｄ３は、図２に示すように、いずれも面実装が可能に構成されたものであり、端子または電極としての面実装用の導体部を有している。すなわち、同図（ａ）に示すように、半導体装置Ｄ１は、いわゆるＪリードタイプと称される構造の樹脂パッケージ型の半導体装置であり、ダイパッド６１上にボンディングされた半導体チップ６０を複数本のリード端子６ａに対してワイヤＷを介して結線接続するとともに、それらワイヤＷや半導体チップ６０などを封止樹脂６２によって樹脂パッケージしたものである。上記複数本のリード端子６ａは、封止樹脂６２の下面にその先端部が位置するように断面略Ｊ字状に屈曲形成されており、これらのリード端子６ａの先端部を利用して面実装が可能となっている。

【００２２】同図（ｂ）に示すように、半導体装置Ｄ２は、いわゆるボールグリッドアレイと称されるタイプの半導体装置であり、上記半導体装置Ｄ１と同様に半導体チップを樹脂パッケージして構成されているが、その封止樹脂６２ａの下面部には、ハンダボールによって形成された複数の突起状の端子６ｂが設けられている。この半導体装置Ｄ２は、本来的には、上記端子６ｂを利用して所望の位置へハンダ付けされるように構成されたものであるが、本願発明では、このような半導体装置も実装対象部品とすることができる。同図（ｃ）に示すように、半導体素子Ｄ３は、たとえばチップ型コンデンサまたはチップ型抵抗器として形成されたものであり、半導体チップ６３の左右両端部に、金属製の電極６ｃ，６ｃが設けられた構成となっている。上記電極６ｃ，６ｃは半導体チップ６３の表面よりも外方に膨らんだ段状に形成されており、この半導体素子Ｄ３は上記電極６ｃ，６ｃを実装対象面に導通接着させることによって面実装可能なものである。

【００２３】上記半導体装置Ｄ１，Ｄ２、および半導体素子Ｄ３のそれぞれを、上記プリント基板１の表面１０に面実装するには、まず図３に示すように、１枚の異方性導電フィルム５を上記プリント基板１の表面１０上に貼付する。この異方性導電フィルム５は、図５によく表れているように、熱硬化性を有するたとえばエポキシ樹脂製フィルム内に金属粒子などの導電性粒子５１を分散させて含有させたものである。この異方性導電フィルム５の内部には、導電性粒子５１が分散しているために、本来的には、その厚み方向に導電性を有しない。ところが、この異方性導電フィルム５がその厚み方向に所定の圧縮力を受けた場合には、その圧縮力を受けた部分の導電性粒子５１の密度が高まってこれらが互いに接触することにより、その圧縮力を受けた部分のみが導電性を有することとなる。本実施形態では、上記プリント基板１上に位置する異方性導電フィルム５が、本願発明でいう異方性導電層に相当する。

【００２４】上記異方性導電フィルム５は、上記プリント基板１の表面１０のかなり広い範囲を覆う形状およびサイズに形成されており、上記異方性導電フィルム５によって複数の端子部形成領域３ａ～３ｃのそれぞれが一連に覆われている。ただし、面実装対象とならない所定の領域４については、上記異方性導電フィルム５によって覆われないように配慮されている。上記異方性導電フィルム５は、プリント基板１の表面１０上に貼付されているが、本願発明でいう貼付とは、かならずしも異方性導電フィルム５がプリント基板表面に積極的に接着されている必要はなく、異方性導電フィルム５をプリント基板表面上に単に載せるだけの場合も含む概念である。なお、実際上は、異方性導電フィルム５がプリント基板１上において不用意に位置ずれしないように、上記異方性導電フィルム５をプリント基板表面に仮接着することが望ましい。

【００２５】次いで、図４および図５に示すように、上記異方性導電フィルム５上には、半導体装置Ｄ１，Ｄ２、および複数の半導体素子Ｄ３を載置する。第１の半導体装置Ｄ１の載置作業は、その複数のリード端子６ａが端子部形成領域３ａの各端子部３０ａの上方に位置するように行う。また同様に、第２の半導体装置Ｄ２については、その複数の端子６ｂが端子部形成領域３ｂの各端子部３０ｂの上方に位置するように載置し、さらに各半導体素子Ｄ３については、その電極６ｃ，６ｃが各端子部形成領域３ｃの各端子部３０ｃの上方に位置するように載置する。

【００２６】また、上記半導体装置Ｄ１，Ｄ２、および

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複数の半導体素子Ｄ３を上記異方性導電フィルム５上に載置したときには、異方性導電フィルム５を加熱しながらそれらの電子部品をこの異方性導電フィルム５の表面に押しつける。具体的には、たとえば図６に示すように、半導体装置Ｄ１をコレット７を利用して異方性導電フィルム５上に載置したときには、このコレット７を利用するなどして半導体装置Ｄ１を下方に押しつける。また、上記異方性導電フィルム５を加熱する手段としては、たとえばプリント基板１の下方にヒータを配置したり、あるいは半導体装置Ｄ１を押圧する部材にヒータを内蔵させるといった手段を採用することができる。さらに、上記半導体装置Ｄ１を押しつけるときには、ホーン７０で発生させた超音波を上記異方性導電フィルム５に作用させる手段を併用することもできる。

【００２７】このような作業を行うと、上記異方性導電フィルム５は、加熱により軟化するとともに、半導体装置Ｄ１のリード端子６ａとそれに対向する端子部３０ａとの間が圧縮力を受け、その部分の導電性粒子５１が上記リード端子６ａの表面と端子部３０ａの表面とにそれぞれ接触することとなる。このため、上記リード端子６ａと端子部３０ａとは導電性粒子５１を介して導通する。この部分に超音波を作用させれば、上記導電性粒子５１を上記リード端子６ａや端子部３０ａの表面に対してより確実に密着させる効果が得られる。これに対し、異方性導電フィルム５の上記以外の箇所については、大きな圧縮力を受けず、導電性粒子５１が分散した状態を保持したままであるから、導電性をもたない。したがって、上記半導体装置Ｄ１については、そのリード端子６ａのみが端子部形成領域３ａの各端子部３０ａと導通接続されることとなる。また、上記半導体装置Ｄ１のリード端子６ａを含む下面部全体は、軟化した異方性導電フィルム５、より正確には、異方性導電フィルム５が溶融軟化した状態の樹脂を介してプリント基板１の表面１０に接着されることとなる。上記異方性導電フィルム５の加熱温度を上昇させると、上記溶融軟化した樹脂を硬化させることができる。したがって、上記半導体装置Ｄ１をプリント基板１の端子部形成領域３ａの表面領域に確実かつ強固に接着保持させておくことが可能となる。このような作用は、他の半導体装置Ｄ２の端子６ｂと端子部形成領域３ｂの各端子部３０ｂや、各半導体素子Ｄ３の電極６ｃ，６ｃと端子部形成領域３ｃの各端子部３０ｃとの関係においても同様に得られる。

【００２８】上記一連の作業工程は、プリント基板１の表面１０の所定領域に１枚の異方性導電フィルム５を貼付してから、半導体装置Ｄ１，Ｄ２や複数の半導体素子Ｄ３をそれぞれ実装する作業工程であり、それら一連の作業は非常に容易となる。したがって、上記プリント基板１、上記半導体装置Ｄ１，Ｄ２、および半導体素子Ｄ３などを用いて構成される電子回路装置の製造コストを安価にすることが可能となる。また、上記異方性導電フィルム５の全体を熱硬化させた後においては、この異方性導電フィルム５の各所のうち、上記各半導体装置Ｄ１，Ｄ２や半導体素子Ｄ３が実装されていない部分が絶縁層となるため、上記異方性導電フィルム５がプリント基板１の表面１０の各所の絶縁保護を図る機能をも発揮することとなる。

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【００２９】図７（ａ），（ｂ）は、本願発明で用いられる異方性導電フィルムの他の例を示す平面図である。

【００３０】すなわち、同図（ａ）に示す異方性導電フィルム５は、その一部に切り欠き部５２を形成した構成である。同図（ｂ）は、異方性導電フィルム５に非切り欠き状の開口孔５３を形成した構成である。このように、異方性導電フィルム５に切り欠き部５２や開口部５３を設ければ、異方性導電フィルムを１枚のフィルム状に形成したまま、この異方性導電フィルム５が配置される箇所を任意に選択できることとなる。ただし、本願発明は、必ずしも異方性導電フィルムを１枚のフィルムとして形成する必要はなく、電子部品の面実装領域が非常に大きなサイズである場合や、あるいはその形状が複雑な場合などにおいては、異方性導電フィルムを複数枚のフィルムに分割してもかまわない。本願発明では、要は、１枚の異方性導電フィルムが複数の端子部形成領域に跨がるように設けられればよい。

【００３１】本願発明は、異方性導電層を形成する手段としては、必ずしも異方性導電フィルムを用いる手段に限定されない。すなわち、本願発明では、異方性導電フィルムに代えて、異方性導電接着剤を用いてもかまわない。この異方性導電接着剤は、たとえば熱硬化性のエポキシ樹脂などの合成樹脂製接着剤内に導電性粒子を分散させて含有させたものであり、この異方性導電接着剤をプリント基板の表面に塗布することによって異方性導電層を形成することができる。この異方性導電接着剤は、それ自体が電子部品をプリント基板の表面に接着させる機能をもつため、電子部品をプリント基板に接着させることを目的としてこの異方性導電接着剤を加熱する必要はない。ただし、異方性導電接着剤を介して電子部品をプリント基板の所定位置に導通接続した後に、この異方性導電接着剤を加熱すれば、この異方性導電接着剤を硬化させることができ、自然放置による硬化の場合よりも短時間で電子部品の実装状態を安定させることができる。

【００３２】その他、本願発明に係る電子部品の実装方法の各作業工程の具体的な構成は、上記実施形態に限定されず、種々に変更自在である。また同様に、本願発明に係る電子回路装置の具体的な構成も、種々に設計変更自在である。本願発明の電子部品の実装方法によって製造される電子回路装置の具体的な種類や用途などは一切問うものではない。さらに、実装対象となる電子部品の種類も限定されず、面実装用の導体部（端子や電極など）を有する電子部品であれば、その種類を問わず、本

願発明の適用対象とすることができる。

【図面の簡単な説明】

【図１】本願発明に係る電子部品の実装方法に用いられるプリント基板の一例を示す平面図である。

【図２】本願発明に係る電子部品の実装方法に用いられる電子部品の具体例を示し、（ａ）は断面図、（ｂ）は斜視図、（ｃ）は断面図である。

【図３】本願発明に係る電子部品の実装方法の作業工程を示す平面図である。

【図４】本願発明に係る電子部品の実装方法の作業工程を示す平面図である。

【図５】本願発明に係る電子部品の実装方法の作業工程を示す要部断面図である。

【図６】本願発明に係る電子部品の実装方法の作業工程



を示す要部断面図である。

【図７】本願発明で用いられる異方性導電フィルムの他の例を示す平面図である。

【符号の説明】

１　プリント基板

５　異方性導電フィルム

１０　表面（電子部品実装対象面）

Ｄ１，Ｄ２　半導体装置（電子部品）

Ｄ３　半導体チップ（電子部品）

３ａ～３ｃ　端子部形成領域

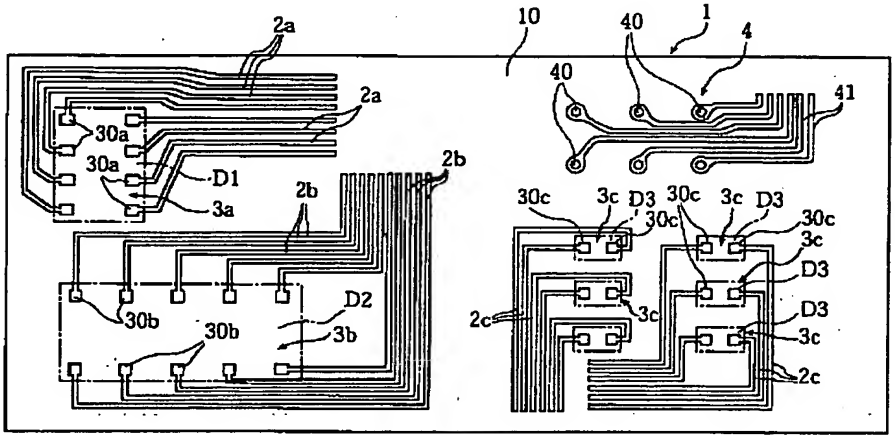
６ａ　リード端子（導体部）

６ｂ　端子（導体部）

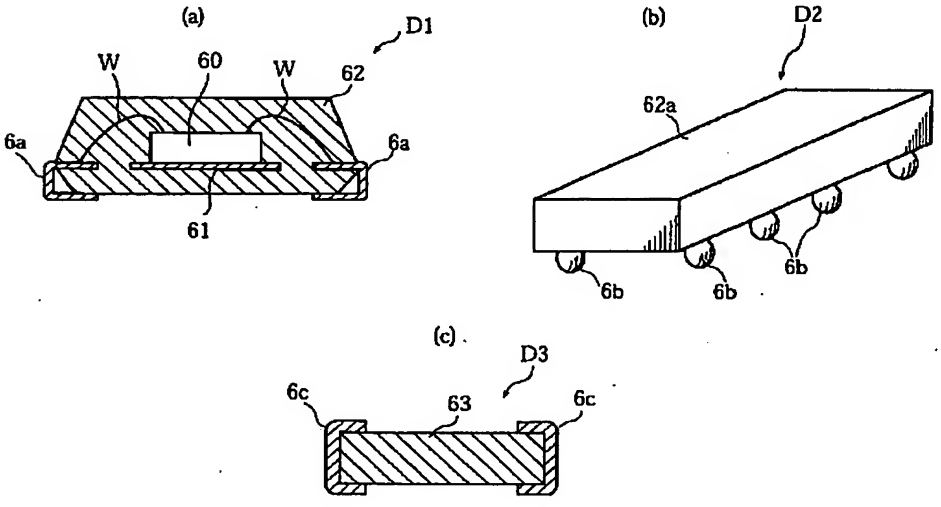
６ｃ　電極（導体部）

３０ａ～３０ｃ　端子部

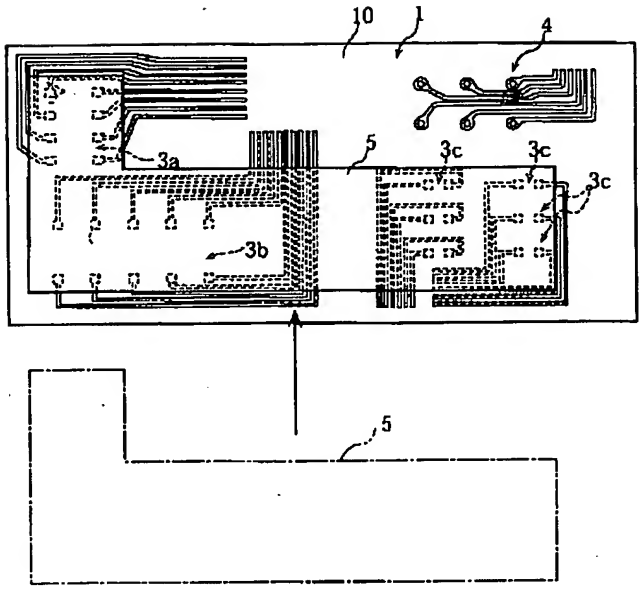
【図１】



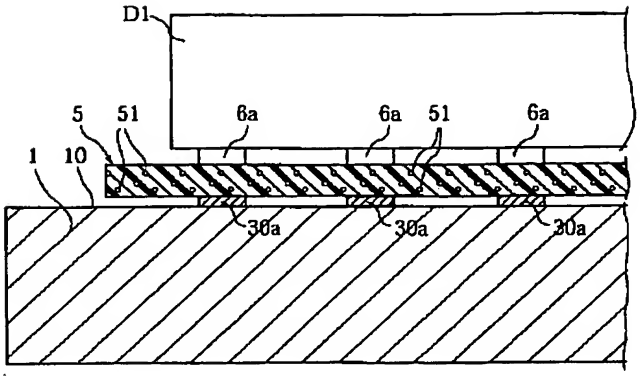

【図２】



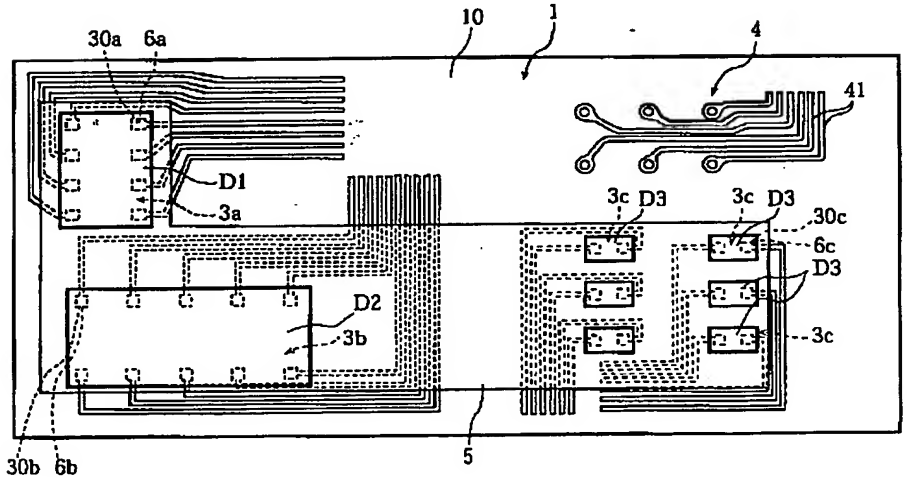
【図３】


10
1
4
3a
5
3c
3c
3c
3b
5

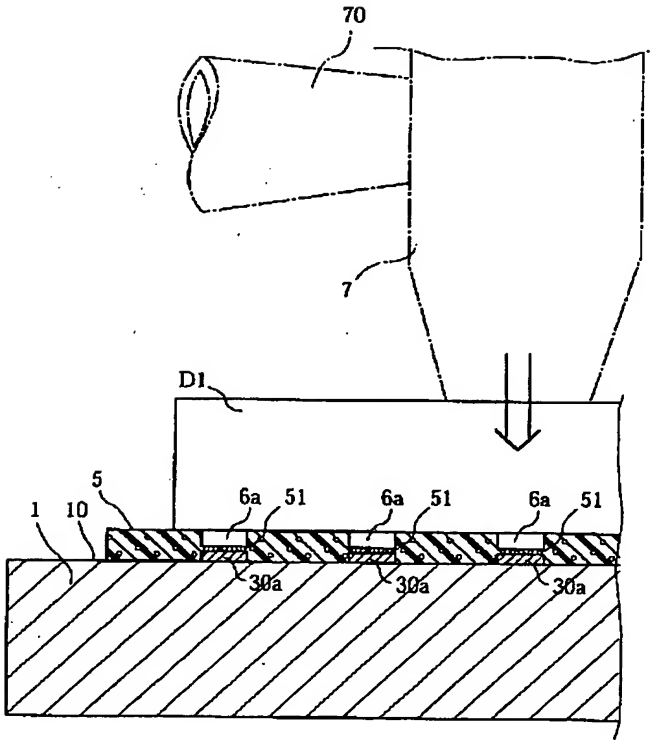
【図５】


D1
5
51
6a
6a
51
6a
1
10
30a
30a
30a

【図４】


10
1
30a
6a
4
41
D1
3a
3c
D3
3c
D3
30c
6c
D3
D2
3b
3c
30b
6b
5

【図６】




【図７】